ABSTRACT OF THE DISCLOSURE

Methods of fixing and processing tissue and samples on a membrane by using ultrasound radiation as a part of the method are presented. Ultrasound of a frequency in the range of 0.1-50 MHz is used and the sample or tissue receives 0.1-200 W/cm^2 of ultrasound intensity. The use of ultrasound allows much shorter times in the methods. Also presented are apparati comprising transducers of one or of multiple heads for producing the ultrasound radiation and further comprising a central processing unit and optionally comprising one or more sensors. Sensors can include those to measure and monitor ultrasound and temperature. This monitoring system allows one to achieve accurate and optimum tissue fixation and processing without overfixation and tissue damage. The system also allows the performance of antigen-antibody reactions or nucleic acid hybridizations to be completed in a very short time while being highly specific and with a very low or no background.